

(I)

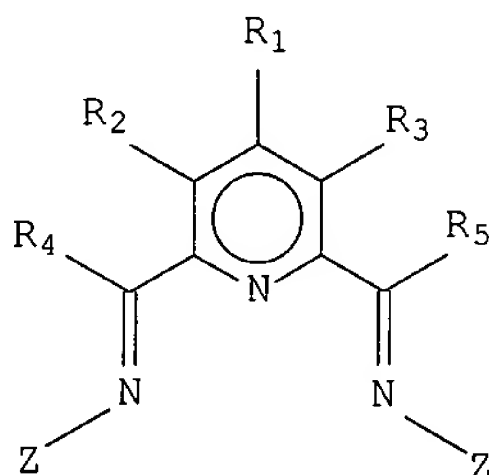
wherein M is a metal atom selected from Fe or Co; a is 2 or 3; X is halide, optionally substituted hydrocarbyl, alkoxide, amide, or hydride; Y is a ligand which may insert an olefin; NC⁻ is a non-coordinating anion; p+q is 2 or 3, matching the formal oxidation of said metal atom; L is a neutral Lewis donor molecule; b = 0, 1, or 2; R₁-R₅ are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R₁-R₃ vicinal to one another taken together may form a ring; each Z, which may be identical or different, is an optionally substituted aromatic hydrocarbon ring; an optionally substituted polyaromatic hydrocarbon moiety; an optionally substituted heterohydrocarbyl moiety; or an optionally substituted aromatic hydrocarbon ring in combination with a metal, said optionally substituted aromatic hydrocarbon ring being π -co-ordinated to the metal; said co-oligomerising being carried out under conditions comprising an ethylene pressure of less than 2.5 MPa.

7. A process for producing higher linear alpha olefins and/or alkyl-branched alpha

olefins comprising:

co-oligomerising one or more alpha olefins other than ethylene with ethylene in the presence of a metal catalyst system employing one or more bis-aryliminepyridine MX_a complexes

and/or one or more [bis-aryliminepyridine $MY_p.L_b^+$][NC^-] $_q$ complexes, said bis-aryliminepyridine complexes comprising a ligand of the formula,



(I)

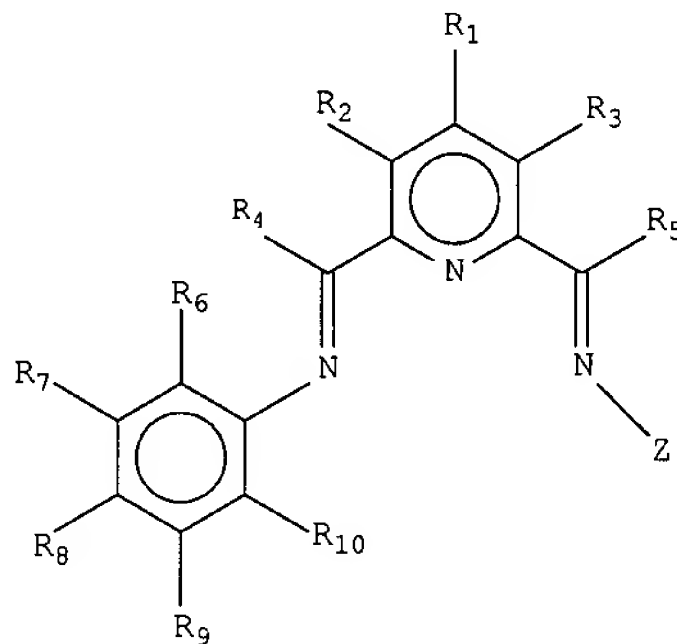
wherein M is a metal atom selected from Fe or Co; a is 2 or 3; X is halide, optionally substituted hydrocarbyl, alkoxide, amide, or hydride; Y is a ligand which may insert an olefin; NC^- is a non-coordinating anion; p+q is 2 or 3, matching the formal oxidation of said metal atom; L is a neutral Lewis donor molecule; b = 0, 1, or 2; R_1 - R_5 are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R_1 - R_3 vicinal to one another taken together may form a ring; each Z, which may be identical or different, is an optionally substituted aromatic hydrocarbon ring; an optionally substituted polyaromatic hydrocarbon moiety; an optionally substituted heterohydrocarbyl moiety; or an optionally substituted aromatic hydrocarbon ring in combination with a metal, said optionally substituted aromatic hydrocarbon ring being π -co-ordinated to the metal; said co-oligomerizing being carried out under conditions comprising an ethylene pressure of less than 2.5 MPa, wherein alpha olefin co-monomer is present in a concentration of greater than 1 mol.l⁻¹.

Please add the following new claims:

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17/13.

(New) The process of claim 7 wherein said ligand is of the formula,

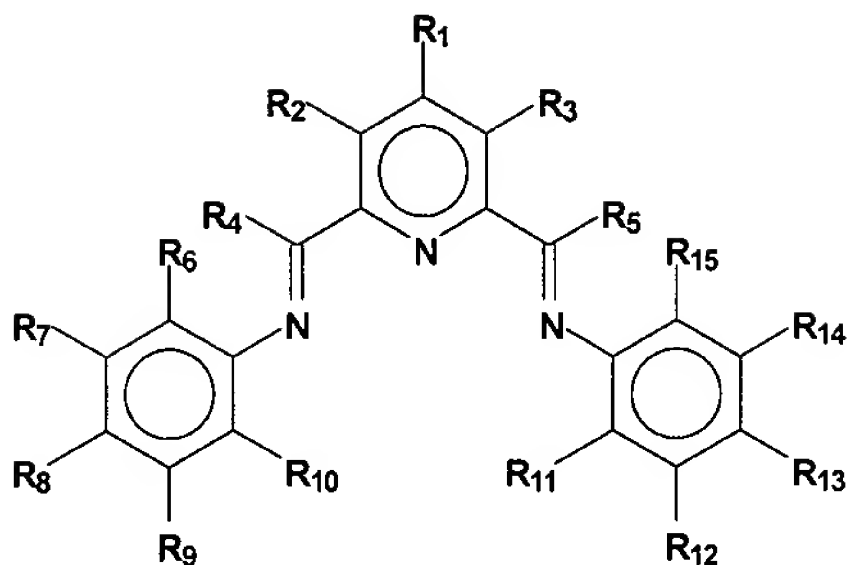


(II)

wherein R₁-R₁₀ are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R₁-R₃, R₆-R₁₀ vicinal to one another taken together may form a ring; R₆ may be taken together with R₄ to form a ring; R₁₀ may be taken together with R₄ to form a ring; Z is an optionally substituted aromatic hydrocarbon ring; an optionally substituted polyaromatic hydrocarbon moiety; an optionally substituted heterohydrocarbyl moiety; or an optionally substituted aromatic hydrocarbon ring in combination with a metal, said optionally substituted aromatic hydrocarbon ring being π -co-ordinated to the metal.

18/14.

(New) The process of claim 7 wherein said ligand is of the formula,



(III)

wherein R₁-R₅, R₇-R₉ and R₁₂-R₁₄ are each, independently, hydrogen, optionally substituted

hydrocarbyl, an inert functional group, or any two of R₁-R₃, R₇-R₉ and R₁₂-R₁₄ vicinal to one another taken together may form a ring; R₆ is hydrogen, optionally substituted

hydrocarbyl, an inert functional group, or taken together with R₇ or R₄ to form a ring; R₁₀

is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken

together with R₉ or R₄ to form a ring; R₁₁ is hydrogen, optionally substituted hydrocarbyl,

an inert functional group, or taken together with R₅ or R₁₂ to form a ring; and R₁₅ is

hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together

with R₅ or R₁₄ to form a ring.

195.

(New) The process of claim 18 wherein R₁-R₅, R₇-R₉ and R₁₂-R₁₄ are each,

independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any

two of R₁-R₃, R₇-R₉ and R₁₂-R₁₄ vicinal to one another taken together may form a ring; R₆ is a

primary carbon group, a secondary carbon group or a tertiary carbon group; and provided that:

when R₆ is a primary carbon group none, one or two of R₁₀, R₁₁ and R₁₅ are primary carbon

groups, and the remainder of R₁₀, R₁₁ and R₁₅ are hydrogen;

when R₆ is a secondary carbon group none or one of R₁₀, R₁₁ and R₁₅ is a primary carbon group

or a secondary carbon group and the remainder of R₁₀, R₁₁ and R₁₅ are hydrogen;

when R₆ is a tertiary carbon group all of R₁₀, R₁₁ and R₁₅ are hydrogen; and

any two of R₆, R₇, R₈, R₉, R₁₀, R₁₁, R₁₂, R₁₃, R₁₄ and R₁₅ vicinal to one another, taken together may form a ring.

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16.

(New) The process of claim 14 wherein R₁-R₅, R₇-R₉ and R₁₂-R₁₄ are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R₁-R₃, R₇-R₉ and R₁₂-R₁₄ vicinal to one another taken together may form a ring; R₆ is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R₇ or R₄ to form a ring; R₁₀ is hydrogen, optionally substituted hydrocarbyl, an inert functional group, or taken together with R₉ or R₄ to form a ring; R₁₁ and R₁₅ are, independently, hydrogen or an inert functional group.

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17.

(New) The process of claim 14 wherein R₁-R₅, R₇-R₉ and R₁₂-R₁₄ are each, independently, hydrogen, optionally substituted hydrocarbyl, an inert functional group, or any two of R₁-R₃, R₇-R₉ and R₁₂-R₁₄ vicinal to one another taken together may form a ring; R₆, R₁₀, R₁₁ and R₁₅ are identical and are each selected from fluorine or chlorine.

22
18.

(New) The process of claim 1 wherein said conditions comprise a temperature of from -about 100°C to about 300°C.

23
19.

(New) The process of claim 1 wherein said conditions comprise a temperature of from about 0°C to about 200°C.

24
20.

(New) The process of claim 7 wherein said conditions comprise a temperature of from -about 100°C to about 300°C.

²⁵
~~21.~~ (New) The process of claim 7 wherein said conditions comprise a temperature of from about 0°C to about 200°C.

²⁶
~~22.~~ (New) The process of claim 7 wherein said conditions comprise a temperature of from about 50°C to about 150°C.

²⁷
~~23.~~ (New) The process of claim ¹⁷~~13~~ wherein said conditions comprise a temperature of from about 100°C to about 300°C.

²⁸
~~24.~~ (New) The process of claim ¹⁷~~13~~ wherein said conditions comprise a temperature of from about 0°C to about 200°C.

²⁹
~~25.~~ (New) The process of claim ¹⁸~~14~~ wherein said conditions comprise a temperature of from about 100°C to about 300°C.

³⁰
~~26.~~ (New) The process of claim ¹⁸~~14~~ wherein said conditions comprise a temperature of from about 0°C to about 200°C.

³¹
~~27.~~ (New) The process of claim ¹⁹~~15~~ wherein said conditions comprise a temperature of from about 100°C to about 300°C.

³²
~~28.~~ (New) The process of claim ¹⁹~~15~~ wherein said conditions comprise a temperature of from about 0°C to about 200°C.

³³
~~29.~~ (New) The process of claim ²⁰~~16~~ wherein said conditions comprise a temperature of from -about 100°C to about 300°C.

³⁴
~~30.~~ (New) The process of claim ²⁰~~16~~ wherein said conditions comprise a temperature of from about 0°C to about 200°C.

³⁵
~~31.~~ (New) The process of claim ²¹~~17~~ wherein said conditions comprise a temperature of from -about 100°C to about 300°C.

*add
12/1/11* ³⁶_{32.} (New) The process of claim ²¹~~17~~ wherein said conditions comprise a temperature of from about 0°C to about 200°C.

³⁷_{33.} (New) The process of claim ²¹~~17~~ wherein said conditions comprise a temperature of from about 50°C to about 150°C.

³⁸_{34.} (New) The process of claim 1 wherein said conditions comprise an ethylene pressure of less than 2.0 MPa.

³⁹_{35.} (New) The process of claim 2 wherein said conditions comprise an ethylene pressure of less than 2.0 MPa.

⁴⁰_{36.} (New) The process of claim 3 wherein said conditions comprise an ethylene pressure of less than 2.0 MPa.

⁴¹_{37.} (New) The process of claim 4 wherein said conditions comprise an ethylene pressure of less than 2.0 MPa.

⁴²_{38.} (New) The process of claim 5 wherein said conditions comprise an ethylene pressure of less than 2.0 MPa.

⁴³_{39.} (New) The process of claim 6 wherein said conditions comprise an ethylene pressure of less than 2.0 MPa.

⁴⁴_{40.} (New) The process of claim 1 wherein said conditions comprise an ethylene pressure of from about 0.1 MPa to about 1.6 MPa.

⁴⁵_{41.} (New) The process of claim 2 wherein said conditions comprise an ethylene pressure of from about 0.1 MPa to about 1.6 MPa.

⁴⁶_{42.} (New) The process of claim 3 wherein said conditions comprise an ethylene pressure of from about 0.1 MPa to about 1.6 MPa.

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contd

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43. (New) The process of claim 4 wherein said conditions comprise an ethylene pressure of from about 0.1 MPa to about 1.6 MPa.

48
44. (New) The process of claim 5 wherein said conditions comprise an ethylene pressure of from about 0.1 MPa to about 1.6 MPa.

49
45. (New) The process of claim 6 wherein said conditions comprise an ethylene pressure of from about 0.1 MPa to about 1.6 MPa.

50
46. (New) The process of claim 1 wherein said alpha olefin co-monomer is present at a concentration of greater than 2.5 mol.l^{-1} .

51
47. (New) The process of claim 1 wherein said alpha olefin co-monomer is present at a concentration of greater than 5 mol.l^{-1} .

52
48. (New) The process of claim 2 wherein said alpha olefin co-monomer is present at a concentration of greater than 2.5 mol.l^{-1} .

53
49. (New) The process of claim 2 wherein said alpha olefin co-monomer is present at a concentration of greater than 5 mol.l^{-1} .

54
50. (New) The process of claim 3 wherein said alpha olefin co-monomer is present at a concentration of greater than 2.5 mol.l^{-1} .

55
51. (New) The process of claim 3 wherein said alpha olefin co-monomer is present at a concentration of greater than 5 mol.l^{-1} .

56
52. (New) The process of claim 4 wherein said alpha olefin co-monomer is present at a concentration of greater than 2.5 mol.l^{-1} .

57
53. (New) The process of claim 4 wherein said alpha olefin co-monomer is present at a concentration of greater than 5 mol.l^{-1} .

~~58~~
~~54.~~ (New) The process of claim 5 wherein said alpha olefin co-monomer is present at a concentration of greater than 2.5 mol.l⁻¹.

~~59~~
~~55.~~ (New) The process of claim 5 wherein said alpha olefin co-monomer is present at a concentration of greater than 5 mol.l⁻¹.

~~60~~
~~56.~~ (New) The process of claim 1 wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~61~~
~~57.~~ (New) The process of claim 7 wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~62~~
~~58.~~ (New) The process of claim ~~13~~¹⁷ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~63~~
~~59.~~ (New) The process of claim ~~14~~¹⁸ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~64~~
~~60.~~ (New) The process of claim ~~15~~¹⁹ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~65~~
~~61.~~ (New) The process of claim ~~16~~²⁰ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~66~~
~~62.~~ (New) The process of claim ~~17~~²¹ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~67~~
~~63.~~ (New) The process of claim ~~20~~²⁴ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

~~68~~
~~64.~~ (New) The process of claim ~~23~~²⁷ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

rule 129 contd ⁶⁹65. (New) The process of claim ⁵⁰~~46~~ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

⁷⁰66. (New) The process of claim ⁵¹~~47~~ wherein said conditions comprise a temperature and pressure effective to yield a product slate with a K-factor of from about 0.40 to about 0.90.

⁷¹67. (New) The process of claim 1 wherein said conditions comprise an inert solvent.

⁷²68. (New) The process of claim 7 wherein said conditions comprise an inert solvent.

⁷³69. (New) The process of claim ⁵⁰~~46~~ wherein said conditions comprise an inert solvent.

⁷⁴70. (New) The process of claim ⁵¹~~47~~ wherein said conditions comprise an inert solvent.

⁷⁵71. (New) The process of claim ⁶⁹~~65~~ wherein said conditions comprise an inert solvent.

⁷⁶72. (New) The process of claim ⁷⁰~~66~~ wherein said conditions comprise an inert solvent.

⁷⁷73. (New) The process of claim ⁷¹~~67~~ wherein said inert solvent is selected from the group consisting of alkanes, alkenes, cycloalkanes, and aromatic hydrocarbons.

⁷⁸74. (New) The process of claim ⁷²~~68~~ wherein said inert solvent is selected from the group consisting of alkanes, alkenes, cycloalkanes, and aromatic hydrocarbons.

⁷⁹75. (New) The process of claim ⁷³~~69~~ wherein said inert solvent is selected from the group consisting of alkanes, alkenes, cycloalkanes, and aromatic hydrocarbons.

⁸⁰76. (New) The process of claim ⁷⁴~~70~~ wherein said inert solvent is selected from the group consisting of alkanes, alkenes, cycloalkanes, and aromatic hydrocarbons.

⁸¹77. (New) The process of claim ⁷⁵~~71~~ wherein said inert solvent is selected from the group consisting of alkanes, alkenes, cycloalkanes, and aromatic hydrocarbons.

⁸²78. (New) The process of claim ⁷⁶~~72~~ wherein said inert solvent is selected from the group consisting of alkanes, alkenes, cycloalkanes, and aromatic hydrocarbons.

83
79. (New) The process of claim ~~67~~⁷⁴ wherein said inert solvent is selected from the group consisting of hexane, isooctane, benzene, toluene, and xylene.

84
80. (New) The process of claim ~~68~~⁷⁷ wherein said inert solvent is selected from the group consisting of hexane, isooctane, benzene, toluene, and xylene.

85
81. (New) The process of claim ~~69~~⁷³ wherein said inert solvent is selected from the group consisting of hexane, isooctane, benzene, toluene, and xylene.

86
82. (New) The process of claim ~~70~~⁷⁴ wherein said inert solvent is selected from the group consisting of hexane, isooctane, benzene, toluene, and xylene.

87
83. (New) The process of claim ~~71~~⁷⁵ wherein said inert solvent is selected from the group consisting of hexane, isooctane, benzene, toluene, and xylene.

88
84. (New) The process of claim ~~72~~⁷⁶ wherein said inert solvent is selected from the group consisting of hexane, isooctane, benzene, toluene, and xylene.

89
85. (New) The process of claim 1 wherein said conditions comprise the absence of air and moisture.

90
86. (New) The process of claim 7 wherein said conditions comprise the absence of air and moisture.

REMARKS

The Amendments

Claim 1 has been amended to correct various matters of form, and to clarify that the term "alpha olefins" refers to olefins other than ethylene. Claim 7 has been essentially rewritten in independent form. The amendments do not narrow the claims.

New claims 13-86 add additional limitations to claims 1 and 7 and are allowable for the